

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of
Hideji Tajima, et al.

Serial No.: 09/909,186

Filed: July 19, 2001

For: Device for Containing, Reacting and Measuring,
and Method of Containing, Reacting and Measuring

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Group Art Unit: 1743

Examiner: Cross, LaToya I.

Confirmation No.: 9114

Mail Stop RCE

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL

Dear Sir:

Applicant submits the following documents for filing in the referenced application:

1. *Request for Continued Examination (RCE) Transmittal;*
2. *Copy of Amendment in Response to Final Office Action mailed December 14, 2004*
as filed on February 14, 2005;
3. *Petition for Extension of Time Under 37 CFR 1.136(a) FY 2005;*
4. *Check in the amount of \$905.00 to cover the fees under 37 CFR 1.17(e), and under*
37 CFR 1.136 and 1.17; and
5. *Return postcard.*

Applicants note that a communication has not been issued and/or received from the U.S. Patent Office responsive to the *Amendment in Response to Final Office Action mailed December 14, 2004* filed on February 14, 2005.

The Commissioner is hereby authorized to charge Deposit Account No. 08-1394 for any additional fees associated with this communication or credit any overpayment.

Respectfully submitted,

Alan N. Herda
Registration No. 50,426

Dated: 6/14/05

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EXPRESS MAIL NO.: EV 369674827US

DATE OF DEPOSIT: June 14, 2005

This paper and fee are being deposited with the U.S. Postal Service Express Mail Post Office to Addressee service under 37 CFR §1.10 on the date indicated above and is addressed to the Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

SANDRA KUBIN

Name of person mailing paper and fee

Signature of person mailing paper and fee

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Confirmation No.: 9114

Mail Stop AF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT IN RESPONSE TO FINAL OFFICE ACTION
MAILED DECEMBER 14, 2004

I. Introductory Comments

The present paper is submitted in response to the final Office Action mailed December 14, 2004.

No fees, including extension of time fees, are believed necessary for consideration of the present paper. However, if any fees, including extension of time fees are necessary, the extension of time is hereby requested, and the Commissioner is hereby authorized to charge any fees, including those for the extension of time, to Haynes and Boone, LLP's Deposit Account No. 08-1394.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 10 of this paper.

II. Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-10 (canceled)

11. (withdrawn) A method of containing, reacting and measuring having: a containing step for containing in a transparent container, a base member of a long and slender shape such as a filament, a braid, or tape, with various substances for detection having predetermined chemical structures fixed thereto along a longitudinal direction with each of the chemical structures associated with their fixed positions; a reaction step for drawing a liquid suspending a labeled target substance to inside said container section and immersing said base member in said liquid to react said target substance with said substance for detection; a measurement preparation step for removing said liquid and any target substance which has not contributed to the reaction; and a measurement step for measuring light from the base member contained in said container section.

12. (withdrawn) A method of containing, reacting and measuring according to claim 11, wherein said measurement step scans all fixed positions of said base member by relatively moving said container section or a light receiving position.

13. (withdrawn) A method of containing, reacting and measuring according to claim 11, wherein in said measurement preparation step there is included a step for drawing measurement liquid after removing target substances which have not contributed to reaction and liquid suspending these, and said measurement step measures in a condition with said base member immersed in measurement liquid.

14. (withdrawn) A method of etc according to claim 11, wherein in said reaction step, said container section is shaken, or drawing and discharging is repeated.

15. (previously presented) A device comprising:
- a cylindrical structure having a longitudinal axis;
 - a plurality of detection substances each comprising a predetermined chemical structure; and
 - a base member to which each detection substance is fixed, the base member having:
 - an unrolled configuration in which:
 - the detection substances are arranged in a predetermined order along the longitudinal length of the base member; and
 - each pair of adjacent detection substances are spaced at a predetermined longitudinal spacing along the longitudinal length of the base member; and
 - a rolled configuration in which:
 - the base member is rolled around the cylindrical structure to define a plurality of circumferentially-extending rolls;
 - each pair of adjacent rolls in the plurality of circumferentially-extending rolls are spaced at a predetermined axial spacing along the longitudinal axis of the cylindrical structure;
 - each detection substance is exposed outwards and fixed to the base member at a predetermined fixed position relative to the outer surface of the cylindrical structure; and
 - each predetermined fixed position is defined by:
 - the predetermined order along the longitudinal length of the base member,
 - the predetermined longitudinal spacings along the longitudinal length of the base member, and
 - the predetermined axial spacings along the longitudinal axis of the cylindrical structure.

16. (previously presented) The device of claim 15 wherein, when the base member is in the rolled configuration and exposed to a target substance, the predetermined chemical structure of at least one detection substance reacts with the target substance at the corresponding predetermined fixed position.
17. (previously presented) The device of claim 16 wherein, when the base member is in the rolled configuration and exposed to a target substance, the predetermined chemical structure of at least one other detection substance reacts with the target substance at the corresponding predetermined fixed position; and
wherein the reactions at the corresponding predetermined fixed positions result in an identification pattern.
18. (previously presented) The device of claim 15 further comprising:
a liquid in which at least a portion of the base member is immersed when the base member is in the rolled configuration; and
a target substance suspended in the liquid;
wherein the predetermined chemical structure of at least one detection substance reacts with the target substance at the corresponding predetermined fixed position.
19. (previously presented) The device of claim 18 wherein the predetermined chemical structure of at least one other detection substance reacts with the target substance at the corresponding predetermined fixed position; and
wherein the reactions at the corresponding predetermined fixed positions result in an identification pattern.
20. (previously presented) The device of claim 15 further comprising:
a tubular member wherein, when the base member is in the rolled configuration, the base member and the cylindrical structure are disposed in the tubular member; and
means connected to the tubular member for drawing liquid into the tubular member and discharging the liquid from the tubular member wherein at least one target

substance is suspended in the liquid and reacts with the detection substances at the corresponding predetermined fixed positions; and

means positioned outside of the tubular member for identifying the target substance after the target substance has reacted with the detection substances, the identifying means comprising:

means for irradiating excitation light through the wall of the tubular member; and

means for receiving emissions propagating through the wall of the tubular member and from the predetermined fixed positions in response to the excitation light.

21. (previously presented) The device of claim 20 further comprising means for effecting relative movement between the receiving means and the tubular member.

22. (previously presented) The device of claim 21 wherein the movement is translational and/or rotational.

23. (previously presented) The device of claim 20 wherein the emissions are in the form of fluorescence.

24. (previously presented) The device of claim 20 wherein the emissions are in the form of electromagnetic waves.

25. (previously presented) A device comprising:

a tubular member;

a base member disposed in the tubular member;

a plurality of detection substances fixed to the base member wherein each detection substance comprises a predetermined chemical structure and is fixed to the base member at a predetermined fixed position;

means connected to the tubular member for drawing liquid into the tubular member and discharging the liquid from the tubular member wherein at least one target

substance is suspended in the liquid and reacts with the detection substances at the corresponding predetermined fixed positions; and

means positioned outside of the tubular member for identifying the target substance after the target substance has reacted with the detection substances, the identifying means comprising:

means for irradiating excitation light through the wall of the tubular member; and

means for receiving emissions propagating through the wall of the tubular member and from the predetermined fixed positions in response to the excitation light.

26. (previously presented) The device of claim 25 further comprising means for effecting relative movement between the receiving means and the tubular member.

27. (previously presented) The device of claim 26 wherein the movement is translational and/or rotational.

28. (previously presented) The device of claim 25 further comprising a cylindrical structure having a longitudinal axis;

wherein the base member has:

an unrolled configuration in which:

the detection substances are arranged in a predetermined order along the longitudinal length of the base member; and

each pair of adjacent detection substances are spaced at a predetermined longitudinal spacing along the longitudinal length of the base member; and

a rolled configuration in which:

the base member is rolled around the cylindrical structure to define a plurality of circumferentially-extending rolls;

each pair of adjacent rolls in the plurality of circumferentially-
extending rolls are spaced at a predetermined axial spacing along the
longitudinal axis of the cylindrical structure;

the base member is disposed in the tubular member;

each detection substance is exposed outwards at the
corresponding predetermined fixed position relative to the outer surface of
the cylindrical structure; and

each predetermined fixed position is defined by:

the predetermined order along the longitudinal length of the
base member,

the predetermined longitudinal spacings along the
longitudinal length of the base member, and

the predetermined axial spacings along the longitudinal axis
of the cylindrical structure.

29. (previously presented) The device of claim 25 further comprising a core wherein
the base member is spirally wound around the core.

30. (previously presented) The device of claim 25 wherein the reactions at the
corresponding predetermined fixed positions result in an identification pattern.

31. (previously presented) The device of claim 25 wherein the emissions are in the
form of fluorescence.

32. (previously presented) The device of claim 25 wherein the emissions are in the
form of chemiluminescence.

33. (previously presented) The device of claim 25 wherein the emissions are in the
form of electromagnetic waves.

34. (previously presented) The device of claim 25 further comprising a light shielding box wherein the tubular member is disposed in the light shielding box.
35. (previously presented) The device of claim 34 wherein the receiving means is disposed in the light shielding box.
36. (previously presented) The device of claim 25 wherein the irradiating means comprises a light source.
37. (previously presented) The device of claim 36 wherein the receiving means comprises at least one photodetector.
38. (previously presented) The device of claim 37 further comprising at least one optical fiber connected to the light source and the photodetector.
39. (previously presented) The device of claim 38 wherein the irradiating and the receiving occur simultaneously.
40. (previously presented) The device of claim 38 further comprising:
at least one other optical fiber;
wherein the receiving means further comprises at least one other photodetector;
and
wherein the one other optical fiber is connected to the light source and the one other photodetector.
41. (previously presented) The device of claim 40 further comprising a rod member spaced from the tubular member in a parallel relation wherein a tip section of each optical fiber is connected to the rod member.

42. (previously presented) The device of claim 40 further comprising an annular member surrounding the tubular member wherein a tip section of each optical fiber is connected to the annular member.

43. (new) A device comprising:

- a light shielding box;

- a tubular member disposed in the light shielding box;

- a base member disposed in the tubular member;

- a plurality of detection substances fixed to the base member wherein each detection substance comprises a predetermined chemical structure and is fixed to the base member at a predetermined fixed position;

- means connected to the tubular member for drawing liquid into the tubular member and discharging the liquid from the tubular member wherein at least one target substance is suspended in the liquid and reacts with the detection substances at the corresponding predetermined fixed positions; and

- means positioned outside of the tubular member for identifying the target substance after the target substance has reacted with the detection substances, the identifying means comprising:

 - means for irradiating excitation light through the wall of the tubular member; and

 - means for receiving emissions propagating through the wall of the tubular member and from the predetermined fixed positions in response to the excitation light.

44. (new) The device of claim 34 wherein the receiving means is disposed in the light shielding box.

III. Remarks

Reconsideration of this application is requested for the reasons set forth below.

The provisional allowance of claim 34 and 35 is acknowledged with appreciation. Claim 34 has been rewritten in independent form as new claim 43, and claim 44 has been added which is identical to claim 35 but is dependent on claim 43.

Claims 1-10 have been cancelled, claims 11-14 have been withdrawn, and claims 15-42 have been maintained in their previous form.

Applicant traverses the previous rejection of claims 15-33 and 36-42 under 35 U.S.C. §103(a) as being unpatentable over Heynecker in view of Walt et al. for the following reasons.

Claim 15

Claims 15 recites the unique combination of a cylindrical structure having a longitudinal axis; a plurality of detection substances each comprising a predetermined chemical structure; and a base member to which each detection substance is fixed, the base member having an unrolled configuration in which the detection substances are arranged in a predetermined order along the longitudinal length of the base member; and each pair of adjacent detection substances are spaced at a predetermined longitudinal spacing along the longitudinal length of the base member; and a rolled configuration in which the base member is rolled around the cylindrical structure to define a plurality of circumferentially-extending rolls; each pair of adjacent rolls in the plurality of circumferentially-extending rolls are spaced at a predetermined axial spacing along the longitudinal axis of the cylindrical structure; each detection substance is exposed outwards and fixed to the base member at a predetermined fixed position relative to the outer surface of the cylindrical structure; and each predetermined fixed position is defined by the predetermined order along the longitudinal length of the base member, the predetermined longitudinal spacings along the longitudinal length of the base member, and the predetermined axial spacings along the longitudinal axis of the cylindrical structure.

With this arrangement, the base member can be rolled along a spiral line (as shown in Figs. 3 and 4 of the present application) so that positioning for measuring can be easily, continuously, and positively performed along the spiral line, despite the

compact design. Also, a standard position need not be predetermined in each circumferentially-extending roll for positioning, since each roll is continuously connected as a single base member. Moreover, the integration is performed with two separate stages - a first integration for preparing a single base member to which each detection substance is fixed, and a second integration for winding the base member. The integrations can be completed simply, easily, quickly, reliably, and at a relatively low cost. Further, the fixed positions are wound along a spiral line in a state measurable from the outside so that the base member can be made in a three dimensional shape. As a result, the measurable area of the substance for detection is increased so that measurement from the outside is easy, and reliability is thus increased. For example, in the case where the base member is opaque or translucent, then not only the outermost surface of the base member is measurable but also the side face of the base member. As a result, even if the base member is wound twisted, the fixed positions can be measured from the outside. Moreover, the respective fixed positions may be measured three dimensionally by providing light receiving sections at two different positions so as to be able to receive light in different directions, and viewing stereoscopically.

As stated in the record, the PTO recognizes, in MPEP §2142:

'The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness.'

The examiner clearly cannot establish a *prima facie* case of obviousness in connection with claim 15 since 35 U.S.C. §103(a) provides that:

"[a] patent may not be obtained ... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains..."(emphasis added)

Thus, when evaluating a claim for determining obviousness, all limitations of the claim must be evaluated, and in the present case, the cited patents to Heynecker and Walt et al., alone, or in combination, do not teach all of the limitations. Rather, neither Heynecker nor Walt disclose a single base member rolled around the cylindrical structure to define a plurality of circumferentially-extending rolls, as shown below. Moreover, according to Heynecker, a standard position needs be predetermined in each

circumferentially-extending roll, since circumferentially-extending rolls are separated from each other. Also, the examiner alleges that Heynecker discloses fibers being spiraled around a center core, as shown in figure 3D. However, it is noted that, in figure 3D, four separately-formed cylindrical composite arrays 100, 101, 102, 103, 104 are stacked up co-axially, and that four cylindrical composite arrays are not formed so as to be spiral. Further, Heynecker states " the circular arrays may be associated to form composite arrays (10), for example, by sliding the rings onto a cylinder, or associating the disks as depicted in Fig. 3D" (column 6, lines 21 to 22). Hence, figure 3D of Heynecker does not disclose the base member being formed so as to be spiral.

Therefore, it is impossible to render the subject matter of claim 15 as a whole obvious based on any combination of the patents, and the above explicit terms of the statute cannot be met. As a result, the examiner's burden of factually supporting a *prima facie* case of obviousness clearly cannot be met with respect to claim 15, and a rejection under 35 U.S.C. §103(a) is not applicable.

There is still another compelling, and mutually exclusive, reason why the Heynecker and Walt et al. patents cannot be combined and applied to reject claim 15 under 35 U.S.C. §103(a).

The PTO also provides in MPEP §2142:

"[T]he examiner must step backward in time and into the shoes worn by the hypothetical 'person of ordinary skill in the art' when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention 'as a whole' would have been obvious at that time to that person. ...[I]mpermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art."

Here, Heynecker and Walt et al. do not teach, or even suggest, the desirability of the combination since neither teaches or suggests providing a cylindrical structure having a longitudinal axis; a plurality of detection substances each comprising a predetermined chemical structure; and a base member to which each detection substance is fixed, the base member having an unrolled configuration in which the detection substances are arranged in a predetermined order along the longitudinal length of the base member; and each pair of adjacent detection substances are spaced at a predetermined longitudinal spacing along the longitudinal length of the base

member; and a rolled configuration in which the base member is rolled around the cylindrical structure to define a plurality of circumferentially-extending rolls; each pair of adjacent rolls in the plurality of circumferentially-extending rolls are spaced at a predetermined axial spacing along the longitudinal axis of the cylindrical structure; each detection substance is exposed outwards and fixed to the base member at a predetermined fixed position relative to the outer surface of the cylindrical structure; and each predetermined fixed position is defined by the predetermined order along the longitudinal length of the base member, the predetermined longitudinal spacings along the longitudinal length of the base member, and the predetermined axial spacings along the longitudinal axis of the cylindrical structure.

Thus, neither of these patents provides any incentive or motivation supporting the desirability of the combination of claim 15. Therefore, there is simply no basis in the art for combining the references to support a 35 U.S.C. §103(a) rejection of claim 15.

In this context, the MPEP further provides at §2143.01:

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." (emphasis in original)

In the above context, the courts have repeatedly held that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. In the present case it is clear that the examiner's combination arises solely from hindsight based on the invention without any showing, suggestion, incentive or motivation in either reference for the combination as applied to claim 15. Therefore, for this mutually exclusive reason, the examiner's burden of factually supporting a *prima facie* case of obviousness clearly cannot be met with respect to claim 15, and the rejection under 35 U.S.C. §103(a) is not applicable.

Therefore, claim 15 is allowable over the above references and the rejection of claim 15 under 35 U.S.C. §103(a) should be withdrawn.

Claim 25

Claim 25 recites a device comprising a tubular member; a base member disposed in the tubular member; a plurality of detection substances fixed to the base member wherein each detection substance comprises a predetermined chemical structure and is fixed to the base member at a predetermined fixed position; means connected to the tubular member for drawing liquid into the tubular member and discharging the liquid from the tubular member wherein at least one target substance is suspended in the liquid and reacts with the detection substances at the corresponding predetermined fixed positions; and means positioned outside of the tubular member for identifying the target substance after the target substance has reacted with the detection substances, the identifying means comprising means for irradiating excitation light through the wall of the tubular member; and means for receiving emissions propagating through the wall of the tubular member and from the predetermined fixed positions in response to the excitation light.

According to the this combination, the same liquid that is drawn into the tubular member is discharged from the tubular member along with any other liquid in the tubular member. Therefore, the above arrangement permits a precise control of the drawing and discharging of the liquid into and from the tubular member by designating a location or volume of liquid. Also, the above device of the present invention can handle minute quantities of liquid, because the tubular member does not have to be soaked in a liquid.

As stated in the record, the PTO recognizes, in MPEP §2142:

"The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness."

As also stated above, the examiner clearly cannot establish a *prima facie* case of obviousness in connection with claim 25 since 35 U.S.C. §103(a) provides that:

[a] patent may not be obtained ... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains ... (emphasis added)

Thus, when evaluating a claim for determining obviousness, all limitations of the claim must be evaluated. However, Heynecker and Walt et al., alone, or in combination, do not teach the above combination. For example, Heynecker and Walt do not disclose a means connected to the tubular member for drawing liquid into the tubular member and discharging the same liquid from the tubular member. Although Heynecker does disclose rotation through a solution of the test sample (column 6, lines 27 to 31), this action relates only to agitation, but not to drawing liquid into casing 105 and discharging the liquid from the casing. Since, in Heynecker, the rotation is carried out in a solution of test samples, and the inside and outside of the tubular member are always in communication and filled with liquid during rotation. Hence, rotation of the casing and the disk in Heynecker always causes the liquid to keep filling inside and outside of the casing and thus the same liquid cannot be drawn into the casing and discharged from the casing. In other words, the same liquid as the one drawn into the casing cannot be entirely discharged from the casing by rotation, since drawing a part of liquid from outside of the casing into the casing is accompanied with the simultaneous discharge of another portion of the liquid equal in volume to the drawn liquid from the casing, and the same liquid as the one drawn into the casing spreads to the whole solution inside and outside of the casing.

Therefore, it is impossible to render the subject matter of claim 25 as a whole obvious based on any combination of the two patents, and the above explicit terms of the statute cannot be met. As a result, the examiner's burden of factually supporting a *prima facie* case of obviousness clearly cannot be met with respect to claim 25, and a rejection under 35 U.S.C. §103(a) is not applicable.

There is still another compelling, and mutually exclusive, reason why the Heynecker and Walt et al. patents cannot be combined and applied to reject claim 25 under 35 U.S.C. §103(a).

The PTO also provides in MPEP §2142:

[T]he examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person. ...[I]mpermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

Here, Heynecker and Walt et al. do not teach, or even suggest, the desirability of the combination since neither teaches or suggests the above unique combination of claim 25.

Thus, neither of these patents provides any incentive or motivation supporting the desirability of the combination. Therefore, there is simply no basis in the art for combining the references to support a 35 U.S.C. §103(a) rejection of claim 25.

In this context, the MPEP further provides at §2143.01:

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." (emphasis in original)

In the above context, the courts have repeatedly held that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. In the present case it is clear that the examiner's combination arises solely from hindsight based on the invention without any showing, suggestion, incentive or motivation in either reference for the combination as applied to claim 25. Therefore, for this mutually exclusive reason, the examiner's burden of factually supporting a *prima facie* case of obviousness clearly cannot be met with respect to claim 25, and the rejection under 35 U.S.C. §103(a) is not applicable.

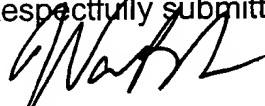
Therefore, claim 25 is allowable over the above references and the rejection of this claim under 35 U.S.C. §103(a) should be withdrawn.

Dependent claims 16-24 and 26-42 depend from, and further limit, independent claims 20 and 25, respectively, in a patentable sense and therefore are also allowable.

In view of all of the above, the allowance of claims 15-42 (in addition, of course, to claims 43 and 44) is respectfully requested.

The examiner is invited to call the undersigned at the below-listed telephone number if a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,



Warren B. Kice
Registration No. 22,732

Dated: 2/14/05

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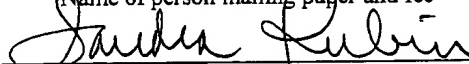
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DATE OF DEPOSIT: February 14, 2005

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SANDRA KUBIN

Name of person mailing paper and fee



Signature of person mailing paper and fee